

REMARKS

Claims 1-3, 5-11 and 13-16 are pending in the application. Favorable reconsideration of the application, as presently amended, is respectfully requested.

In the Office Action, Claims 1-3, 5-11 and 13-16 have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. In particular, Claims 1 and 9 have been rejected because these claims contain the transitional language “a polyurethane foam that consists essentially of ...” and the Examiner contends that Claims 1 and 9 can be construed to exclude polyurethane in particular. Claims 1 and 9 have been amended to positively recite “ a polyurethane foam” in the body of the Claim.

In addition, Claims 7 and 13 have been amended to remove the term “about” before the term “one” describing the alkyl moiety of component (a) in the polyurethane foam. Therefore, as amended, the alkyl moiety of component (a) in Claims 7 and 13 can have “one to about five carbons.” Applicants respectfully submit that the practice of using the term “about” to describe the upper limit of a range is a well-known and well-accepted practice in claim drafting and appears in countless issued patents. Moreover, the meaning of the term “about” is well established in the law. Therefore, Applicants respectfully submit that the phrase “one to about five carbons” is not indefinite. In addition, Claim 13 has been amended to correct the spelling of the term “number.”

The Examiner also contends that Claims 15 and 16 fail to further limit the scope of the Claims from which they depend since the recited “species are outside the scope of the formulas within Claims 7 and 13.” (Office Acton page 3). Resorcinol diphenyl phosphate has been deleted from Claims 15 and 16. Each of the remaining species recited in Claims 15 and 16 are identified at page 3, lines 1-15 of the specification to fall

within the formula $P(O)(OR)_3$, where R is an alkyl moiety containing from one to about five carbon atoms or an aryl moiety. Therefore these Claims are deemed to be in proper dependent form.

In view of the foregoing, the Applicants respectfully request that the rejection of Claims 1-3, 5-11 and 13-16 under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn.

In the Office Action, Claims 15 and 16 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 15 and 16 have been amended so as to replace the phrase “at least one” with standard Markush language. In addition, resorcinol diphenyl phosphate has been deleted from Claims 15 and 16. Support for the species isopropyl triphenyl phosphate can be found at page 3 of the specification and in the Examples. Support for poly (ethyl ethyleneoxy)phosphate can be found at bottom of page 4 of the specification and in the Examples. Accordingly, the Applicants respectfully request that the rejection of Claims 15 and 16 under 35 U.S.C. § 112, first paragraph be reconsidered and withdrawn.

In the Office Action, Claims 7, 8 and 13-16 have been rejected under 35 U.S.C. §112, first paragraph, for allegedly not being enabled by the specification. By way of this amendment, independent Claims 7 and 13 (and therefore dependent Claims 8, 14-15) have been amended to positively recite “polyurethane foam.” In view of the foregoing the rejection of Claims 7, 8 and 13-16 under 35 U.S.C. §112, first paragraph, is now moot.

In the Office Action, Claims 1-3, 5, 6 and 9-11 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Fearing ('534 or '633) in view of Keppler et al. ('612).

In making the rejection, the Examiner acknowledges "that although Fearing discloses that additional flame retarding agents may be used, the primary references fail to recite specific examples." (See Office Action p. 5, para.7). Instead, the Examiner takes the position that "it would have been *prima facie* obvious to select a non-halogenated phosphate ester flame retardant from the numerous flame retardants of Keppler and employ said flame retardant as a component of the aforementioned, disclosed flame retardant blend of the primary references." (See Office Action, page 5, para. 8).

However, merely combining any two or more flame-retardants to make a new flame retardant blend for use in a polyurethane foam is not Applicants' invention. Rather, Applicants are claiming polyurethane foams containing the particular blend of flame retardants recited in the claims; a blend that is neither disclosed nor suggested by the combination of references cited by the Examiner and moreover a blend that provides unexpected flame-retardancy when incorporated into a polyurethane foam, as discussed in the specification and herein below. The Examiner's statement that "non-halogenated flame retardants were widely known flame retardants for polyurethane foams at the time of the invention" does not relieve the Examiner of the requirement when making the obviousness rejection, to show where in the prior art the suggestion and/or motivation to blend the specific flame retardants recited in the Claims is found.

In view of the foregoing, Applicants respectfully submit that the Examiner has not provided the requisite motivation and/or suggestion in the prior art of record to

provide a polyurethane foam containing the blend of (a) non-oligomeric, non-halogenated, phosphate ester flame retardant with (b) an oligomeric, non-halogenated organophosphate flame retardant as recited in the instant Claims. However, that is what is required to make a *prima facie* case of obviousness.

Notwithstanding and even assuming *arguendo* that the Examiner has established a *prima facie* case of obviousness, the data provided in the specification at pages 8-16 and summarized by Applicants in the two tables provided hereinbelow show that the particular flame retardant blends of the present invention when used in polyurethane foams provide unexpected synergistic and advantageous effects at different foam densities. It is believed that this showing of unexpected results is sufficient to overcome any *prima facie* case of obviousness. We further note that the Board of Appeals stated at page 15 of the Decision on Appeal dated February 10, 2006, that the Appellants have not argued unexpected results, although the data summarized below was clearly set forth in the original application. Applicants herein, at least in part, base their argument of non-obviousness on unexpected results.

Data Set 1 @ 1.8 pcf

Parts per Hundred necessary to pass test

TB-117 Test			MVSS 302 Test	
Flame Retardant	Actual	Theoretical	Actual	Theoretical
100% BTPP	16	16	14	14
BTPP:PEEOP 1:1	5	10.5	5	9
100%PEEOP	5	5	4	4

Data Set 2 @ 1.8 pcf

% FR necessary to pass test in foam

TB-117			MVSS 302	
FlameRetardant	Actual	Theoretical	Actual	Theoretical
100% BTPP	1.36	1.36	1.19	1.19
BTPP:PEEOP 1:1	0.69	1.15	0.69	0.97
100%PEEOP	0.95	0.95	0.76	0.76

As illustrated by the data above, 1:1 blends of BTPP:PEEOP additives provide a synergistic effect when added to polyurethane foam since the actual amount of flame retardants of the blends required to be added to a polyurethane foam in order to pass the California TB-117 flame retardancy standardized test (TB-117 test) and/or the MVSS 302 flame test used by the automobile manufactures (MVSS-302 test) was unexpectedly less than what would have been predicted from a simple mathematical theoretical calculation of the same blends. For example, in data set 1 above, a polyurethane foam containing a 1:1 BTPP:PEEOP blend passed the TB-117 test at 5 parts in 1.8 pcf foam whereas the theoretical amount, calculated by taking the average of the amounts required to pass the test of the two neat components, was 10.5 parts. In other words, the actual amount necessary to pass this test was less than half the theoretical amount thereby clearly demonstrating the unexpected synergistic effect of the blend in a polyurethane foam.

A polyurethane foam containing the 1:1 BTPP:PEEOP blend also showed a synergistic effect when tested in the MVSS 302 test. In this test, the theoretical amount

(calculated as described above) was 9 parts, and the actual amount required to pass the test was only 5. This again clearly demonstrates the unexpected synergistic flame retardancy effect of a polyurethane foam containing the aforementioned blend. The same synergistic effect shown in data set 1 is shown in data set 2 wherein the percentage of flame retardant in a polyurethane foam necessary to pass both the TB-117 test and the MVSS 302 test is less than the expected theoretical amount necessary to pass the same tests.

Therefore, since the Examiner has not provided sufficient suggestion/motivation required to maintain a *prima facie* case of obviousness and moreover, even if a *prima facie* case had been made, since the claimed polyurethane foam containing the blend of flame retardants results in a polyurethane foam having better than expected flame retardancy, Applicants respectfully request that the rejection of Claims 1-3, 5, 6 and 9-11 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

In the Office Action, Claims 1-3,5-7,9-11,13,15 and 16 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sicken et al. ('965) in view of Keppler et al. ('612). As with the rejection of Claims 1-3, 5, 6 and 9-11 under 35 U.S.C. § 103(a) under Fearing above, in making the rejection the Examiner acknowledges that although "Sicken et al. disclose that additional flame retarding agents may be used, the primary reference fails to recite specific examples." (See Office Action p. 6, para.10). Instead, the Examiner takes the position that "it would have been *prima facie* obvious to select a non-halogenated phosphate ester flame retardant from the numerous flame retardants of Keppler et al. and employ said flame retardant as a component of the

aforementioned, disclosed flame retardant blend of the primary references. (See Office Action, page 6, para. 11).

As in the rejection of Claims 1-3, 5, 6 and 9-11 under 35 U.S.C. § 103(a) over Fearing et al. in view of Keppler et al. ('612) discussed above, the Examiner here too has failed to show where in the prior art the suggestion and/or motivation to blend the specific flame retardants recited in the claims is found. Therefore, as with in the rejections discussed above, the Examiner has not provided the requisite motivation or suggestion to blend (a) a non-oligomeric, non-halogenated, phosphate ester flame retardant with (b) an oligomeric, non-halogenated organophosphate flame retardant (b) to produce a polyurethane foam as claimed.

In view of the foregoing, the Examiner has failed to make a *prima facie* case of obviousness and moreover, even if a *prima facie* case had been made, the data in this application, as summarized hereinabove, demonstrating unexpected flame retardancy results, clearly refutes any such case of *prima facie* obviousness.

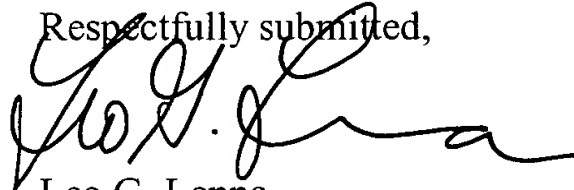
Accordingly, for all of the foregoing reasons, Applicants respectfully request that the rejection of Claims 1-3, 5, 6 and 9-11 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Lastly, in the Office Action Claims 7, 8, 13 and 14 have been rejected under 35 U.S.C. § 103(a) for allegedly being unpatentable over Sicken et al. ('965) in view of Keppler et al. ('612) as applied to Claims 1-3,5-7,9-11,13,15 and 16 above, and in further view of Hardy et al. ('035 or '042). Hardy does not teach the blend of specific flame-retardants recited in the Claims. In addition, Hardy fails to provide the requisite suggestion and/or motivation to blend the specific flame-retardants recited in the Claims

and therefore fails to correct the deficiency present in the combination of Sicken and Keppler. Thus, for the same reasons discussed in the rejections above, Applicants respectfully assert that Hardy et al. ('042) does not provide the requisite suggestion nor motivation to do what the Applicants have done. Also, as stated above, even if Hardy did correct the deficiencies of Sicken and Keppler, and it does not, since the claimed blend of flame-retardants when added to a polyurethane foam produces a polyurethane foam having better than expected flame retardancy properties, it would not have been obvious to do what the Applicants have done. Accordingly, Applicants respectfully request that the rejection of Claims 7, 8, 13 and 14 be reconsidered and withdrawn.

In view of the foregoing, favorable action on the merits and allowance of all the pending claims is respectfully requested.

Respectfully submitted,



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